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# Fetal Well-being Comparative Evaluation in Preeclampsia and Hypertension

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The purpose of our study was a comparative evaluation of fetal condition in pregnancies complicated by preeclampsia and hypertension. A prospective study of 297 pregnancies with preeclampsia, 129 with pregnancy-induced hypertension, 47 with chronic hypertension and 50 as a control group was made. The fetal condition was evaluated by NST, ultrasound fetometry, Doppler assessment of fetal-placental circulation. The perinatal outcomes of the groups were analyzed. Analysis of perinatal pathology revealed a high incidence of intrauterine growth retardation (38.2%), fetal-placental hemodynamic disturbances (30.1%), non-reactive NST (25.9%), oligohydramnios (19.6%) and RDS (25.2%) in severe preeclampsia. There was a high incidence of preterm deliveries in severe preeclampsia (69.6%) and chronic hypertension (24.3%) as well as postnatal hypoxia (34.8% and 23.4%, respectively) compared to control (14.0%),  $P < 0.05$ . Severe fetal compromise was characteristic of severe preeclampsia and chronic hypertension rather than of mild preeclampsia and pregnancy-induced hypertension, therefore the fetal management protocol depends on the type of hypertension in pregnancy.

**Key words:** fetal well-being, hypertension, preeclampsia

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## INTRODUCTION

Approximately 7–12% of all pregnancies are complicated by hypertension (1, 2). Preeclampsia still exists as one of the main obstetrical problems contributing to a high incidence of the perinatal and neonatal pathology. The etiology of the disease is still unknown, but placental disorders are probably involved in the pathophysiological mechanism (3–5). Hypertension not associated with significant proteinuria is considered a relatively benign disorder with no or minor effects on pregnancy outcome (6).

The purpose of this study was a comparative evaluation of fetal condition in pregnancies complicated by preeclampsia and hypertension.

## MATERIALS AND METHODS

During 1995–2000, in Vilnius University Women's Clinic (Tertiary Center) a prospective study of 297 pregnancies with preeclampsia, 129 with pregnancy-induced hypertension, 47 with chronic hypertension and 50 as a control group was made. Of the study cohort, 162 had mild preeclampsia and 135 were classified as severe according to American College of Obstetricians and Gynecologists (7). An analysis

of perinatal pathology and perinatal outcomes was made. The fetal condition was evaluated by fetal movements, NST, ultrasound fetometry, amniotic fluid index. Doppler evaluation of the fetal-placental hemodynamics was made. Comparison between groups was made by the Student's *t* test. The *P* value  $< 0.05$  was considered as significant.

## RESULTS AND DISCUSSION

Analysis of perinatal pathology revealed a high incidence of intrauterine growth retardation, fetal-placental hemodynamics disturbances and oligohydramnios in severe preeclampsia and chronic hypertension (Fig. 1) compared to mild preeclampsia and pregnancy-induced hypertension (Fig. 2). The incidence of non-reactive NST was the same in all groups except control.

There was a high incidence of preterm deliveries in severe preeclampsia (69.6%) and chronic hypertension (Fig. 3).

In agreement with other reports (2, 8), 61.1% newborns of severe preeclampsia group were delivered by cesarean section *versus* 16.0% in the controls ( $P < 0.05$ ).

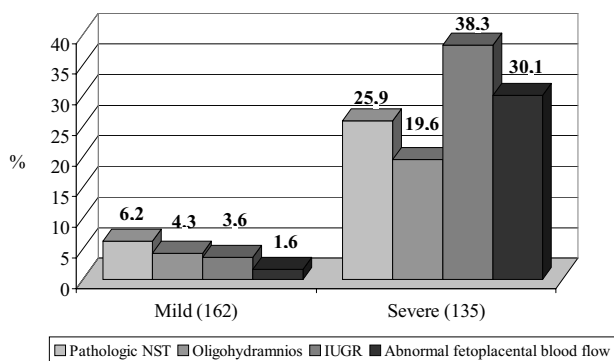


Fig. 1. Incidence of fetal pathology in mild and severe preeclampsia

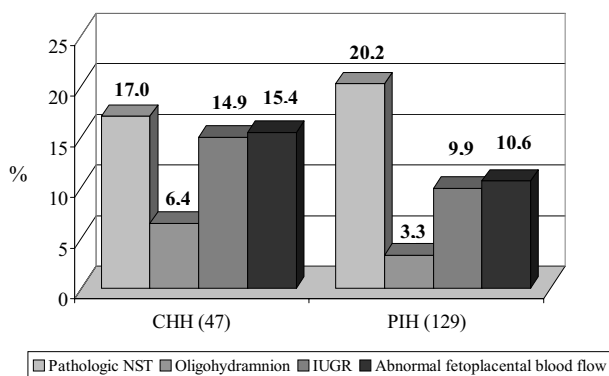


Fig. 2. Incidence of fetal pathology in chronic hypertension (CHH) and pregnancy-induced hypertension (PIH)

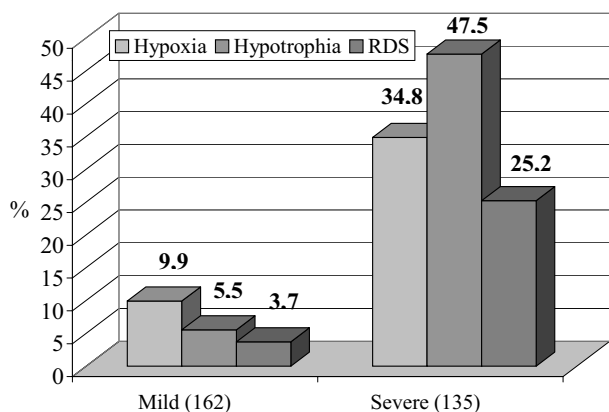


Fig. 3. Incidence of neonatal morbidity in chronic hypertension (CHH), PIH and Control group (C)

All perinatal deaths (22 cases) occurred in the severe preeclampsia group. The main causes of perinatal deaths were hypoxia and RDS in association with severe prematurity.

The neonatal morbidity (hypoxia, hypotrophia, RDS) was highest in cases of severe preeclampsia and chronic hypertension (Figs. 3, 4).

Thus preeclampsia, especially in its severe forms, run an increased risk of perinatal morbidity and

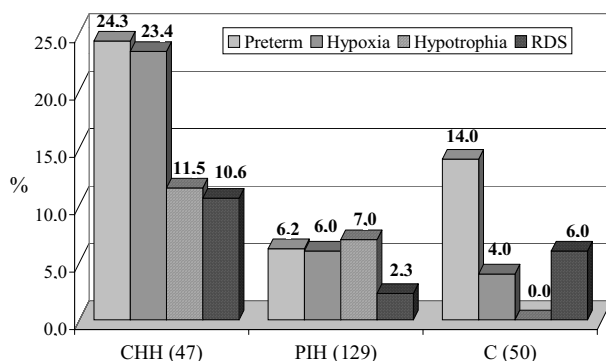


Fig. 4. Incidence of neonatal morbidity in mild and severe preeclampsia

mortality and maternal complications (HELLP syndrome, placental abruption, oliguria, eclampsia).

Our data are in agreement with the studies (6, 9) that report an increased incidence of RDS, fetal growth restriction in babies of hypertensive mothers. The presence of albuminuria in pregnant patients with hypertension carries an increased risk of maternal and fetal complications. However, in patients with established preeclampsia the degree of albumin excretion and hyperuricemia is not related to adverse outcome (6).

The ultimate goal of any protocol for the management of preeclampsia must be maternal safety first, followed by delivery of a live mature newborn in optimal condition (7). Several technologies (NST, ultrasound, Doppler velocimetry) used also in our study, are applied for fetal well-being assessment in high-risk pregnancies with the aim of preventing neonatal sequelae (10). The degree of abnormality of the Doppler findings parallels the severity of fetal compromise (1, 11). The recent meta-analysis shows that the only single technology that has been investigated thoroughly in high-risk pregnancies is umbilical artery Doppler ultrasonography (12).

We concluded that severe fetal compromise (intrauterine growth retardation, oligohydramnios, fetal hemodynamics disturbances) was characteristic of chronic hypertension and severe preeclampsia rather than of mild preeclampsia and pregnancy-induced hypertension. Therefore the fetal management protocol should depend on the type of hypertension in pregnancy and fetal-placental blood flow.

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#### A. Arlauskienė

#### PALYGINAMASIS VAISIAUS BŪKLĖS VERTINIMAS ESANT PREEKLAMPSIJAI IR HIPERTENZIJAI

#### S a n t r a u k a

Darbo tikslas buvo palyginti vaisiaus būklės ypatumus esant nėščiųjų hipertenzijai, preeklampsijai bei pirminei arterinei hipertenzijai. Atlikta prospektyvinė 523 nėščiųjų nėštumo ir gimdymo eigos analizė, vaisiaus bei naujagimio būklės vertinimas. 129 moterys sirgo nėščiųjų hipertenzija, 47 – pirmine arterine hipertenzija, 297 – preeklampsija (iš jų 135 – sunkia), 50 sudarė kontrolinę grupę. Rasta, kad nėštumo hipertenzija ir lengva preeklampsija nesukėlė ženklių vaisiaus ir naujagimio būklės pakeitimų. Sunki preeklampsija dažniausiai sąlygojo perinatalinę patologiją: vaisiaus augimo sulėtėjimą (38,2%), vaisiaus-placentos kraujotakos sutrikimus (30,1%), nereaktyvią KTG (25,9%), oligohidramnioną (19,6%), naujagimio RDS (25,2%). Esant pirminei arterinei hipertenzijai ir sunkiai preeklampsijai, dažnesni prieššlaikiniai gimdymai (atitinkamai 24,3% ir 69,6%) lyginant su kontrole (14,0%); taip pat dažniau stebėta postnatalinė hipoksija (atitinkamai 23,4%, 34,8% ir 4,0%,  $P < 0,005$ ). Palyginamasis vaisiaus būklės tyrimas parodė, kad įvairių nėščiųjų hipertenzinių būklių atvejais, ypač esant vaisiaus-placentos kraujotakos sutrikimams, taikytini skirtingi vaisiaus būklės stebėjimo režimai.

**Raktažodžiai:** vaisiaus būklė, hipertenzija, preeklampsija